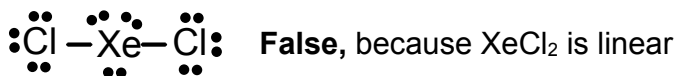
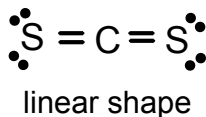
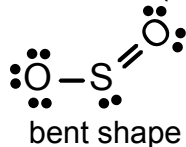


- 20) a. True,  $\text{XeF}_2$  has 22 valence electrons. You end up with an expanded octet.
- b. False, oxygen must obey the octet rule (2nd energy level doesn't have any d-orbitals), but sulfur can (and often does) have an expanded octet.
- c.  $\text{NO}^+$  has 10 v.e-  $\text{NO}^-$  has 12 v.e-  
 $[\text{:N}\equiv\text{O:}]^+$   $[\text{:N}=\text{O:}]^-$  True, triple bonds are stronger than double bonds.
- d.  $\text{O}=\text{O}=\text{O}$   $\leftrightarrow$   $\text{O}=\text{O}=\text{O}$  False, these are resonant structures, so each bond is really the average ( $1\frac{1}{2}$  bonds.)

- 22) a.  $\text{XeCl}_2$   $8 + 2(7) = 22$  v.e-



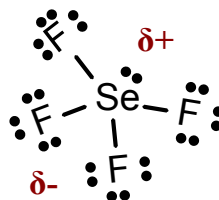
- b.  $\text{SO}_2$   $6 + 2(6) = 18$  v.e-  $\text{CS}_2$   $4 + 2(6) = 16$  v.e-



False

- c. True,  $\text{CF}_4$  is tetrahedral and  $\text{KrF}_4$  is square planar, so the fluorines all cancel. However,  $\text{SeF}_4$  is polar:

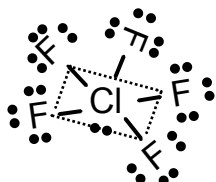
$\text{SeF}_4$ :  $6 + 4(7) = 34$  v.e-



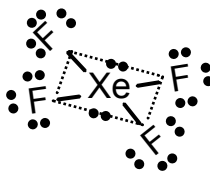
- d. False, they adopt a geometry to minimize electron repulsion.

90)  $\text{ClF}_5 - 7 + 5(7) = 42 \text{ v.e.}$

$\text{XeF}_4 - 8 + 4(7) = 36 \text{ v.e.}$



square pyramidal

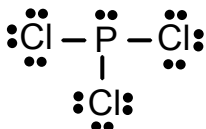


square planar

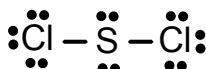
92)  $\text{PCl}_3 - 26 \text{ v.e.}$

$\text{SCl}_2 - 20 \text{ v.e.}$

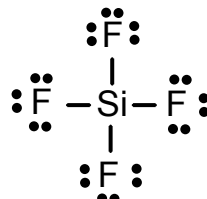
$\text{SiF}_4 - 32 \text{ v.e.}$



trigonal pyramidal ( $107^\circ$ )



linear ( $180^\circ$ )

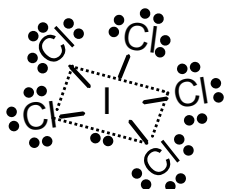


tetrahedral ( $109.5^\circ$ )

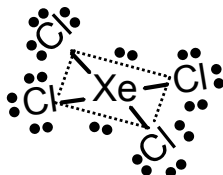
94)  $\text{ICl}_5 = 42 \text{ v.e.}$

$\text{XeCl}_4 = 36 \text{ v.e.}$

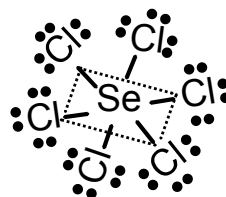
$\text{SeCl}_6 = 50 \text{ v.e.}$



square pyramidal ( $90^\circ$ )



square planar ( $90^\circ$ )



octahedral ( $90^\circ$ )

96) Only  $\text{PCl}_3$  (trigonal pyramidal) is polar. The dipole moments in the other two molecules cancel out.

103) In all five cases, the shapes are symmetrical so the dipole moments cancel out.